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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,046	08/21/2003	Steven Don Arnold	H0004511	1546

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EXAMINER	
TRIEU, THAI BA	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/647,046	ARNOLD, STEVEN DON	
	Examiner	Art Unit	
	Thai-Ba Trieu	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *08/21/03&01/30/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: ***"60"*** (SEE Figures 1-2). Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the ***"case having a turbine housing"*** (See Claim 8, line2) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3, 5-9, 11, 13-17 and 19-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Gladden et al. (Patent Number 6,301,889 B1).

Regarding claims 1-3, Gladden discloses an Exhaust Gas Recirculation (EGR) system providing a mixture of exhaust gas and intake air to the intake of an internal

combustion engine, the system comprising a turbocharger (12) including a compressor (26) with more than one stage (See Figure 1);

wherein intake air is compressed in at least one first stage of the compressor (46, 50), and a mixture of intake air and exhaust gas is compressed in at least one second stage of the compressor (48, 56) (See Figure 1); and

wherein the compressor has two stages (46 and 50; 48 and 56) (SEE Figure 1).

Regarding claims 5-9, 11 and 20, Gladden further discloses a control valve (82), which determines the proportion of exhaust gas produced by the engine to be recirculated (Column 4, lines 5-20);

an EGR mixer (64) to mix the exhaust gas with intake air to form the mixture (See Figure 1);

wherein the intake air is compressed by at least one first stage of the turbocharger to achieve a first intermediate pressure, the first intermediate pressure being less than an intake pressure at an intake manifold of the engine, and wherein back pressure from a turbocharger turbine maintains a pressure of the exhaust gas at a second intermediate pressure, the second intermediate pressure being less than an intake pressure at an intake manifold of the engine (See Column 4, lines 34-46);

wherein the turbocharger comprises: a case (28A, 28B, 28C, and 28D) having a turbine housing (28D) receiving exhaust gas from an exhaust manifold of an internal combustion engine at an inlet (30) and having an exhaust outlet

(33), a compressor housing (28A, 28B) having an air inlet (52) and a first volute, and a center housing (28C) intermediate the turbine housing (28D) and compressor housing (28A, 28B) (See Figure 1);

a turbine wheel (42) carried within the turbine housing (28D) and extracting energy from the exhaust gas, said turbine wheel (42) connected to a shaft (38) extending from the turbine housing (28D) through a shaft bore in the center housing (28C) (See Figure 1);

a bearing (40) supported in the shaft bore of the center housing (28C), said bearing (40) supporting the shaft (38) for rotational motion (See Figure 1);

a compressor impeller (46, 48) connected to the shaft (8) opposite the turbine wheel (42) and carried within the compressor housing (28A, 28B) said compressor impeller (46, 48) having a first plurality of impeller blades (50, 56) mounted on a front face proximate the air inlet (52, 58), said first plurality of blades (50) increasing the velocity of air from the air inlet (52) and exhausting air into the first volute, said compressor impeller also having a second plurality of impeller blades (56) mounted on a back face, said second plurality of blades increasing the velocity of air from a scroll inlet connected to the first volute, and exhausting air into a second volute having a charge air outlet (via 74) connected to the engine intake (18), said scroll inlet and second volute integral to the case intermediate said compressor housing (28A, 28B) and turbine housing (28D);

wherein the second plurality of impeller blades (56) compresses the mixture to a pressure required by the engine to transit a desired mass flow (See Figure 1, Column 3, lines 9-67, and Column 4, lines 1-67, and Column 5, lines 1-27); and

at least one cooler (68, 79) (See Figure1).

Regarding claims 13-15, Gladden discloses an EGR system for an internal combustion engine wherein a turbocharger maintains a pressure of exhaust gas at an intermediate pressure lower than a pressure at an intake manifold of the engine, wherein said intermediate pressure is greater than a pressure of intake air, the intake air having been compressed by a first stage of a two stage compressor (See Column 4, lines 34-46);

wherein the compressor (26) forms a part of a turbocharger (12);

wherein the exhaust gas and the intake air are mixed together to form a mixture (at 64), and the mixture is further compressed by a second stage of the two stage compressor (26) until the mixture reaches a pressure sufficient to meet a mass flow demand of the engine (See Column 3, lines 9-67, and Column 4, lines 1-67, and Column 5, lines 1-27).

Regarding claims 16-17 and 19, the method as claimed would be inherent during the normal use and operation of the Gladden device as disclosed (See Column 3, lines 9-67, and Column 4, lines 1-67, and Column 5, lines 1-27).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gladden (Patent Number 6,301,889 B1), in view of Coleman (Patent Number 6,205,785 B1).

Gladden discloses the invention as recited above; however, Gladden fails to disclose the turbocharger being a variable geometry turbocharger.

Coleman teaches that it is conventional in the turbocharged internal combustion engine art having the exhaust gas recirculation system, to utilize a variable geometry turbocharger (46) (See Figures 1-2).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a variable geometry turbocharger, as taught by Coleman, to improve the control of the exhaust gas, in the Gladden device, since the use thereof would have increased the efficiency of the engine.

Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gladden (Patent Number 6,301,889 B1), in view of Shibata et al. (Patent Number EP 1 186 767 A2).

Gladden discloses the invention as recited above; however, Gladden fails to disclose a diesel particulate filter.

Shibata teaches that it is conventional in the turbocharged internal combustion engine art having the exhaust gas recirculation system, to utilize a diesel particulate filter (36) to filter the exhaust gas before the exhaust gas enters the first plurality of blades (See Figure 1).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a diesel particulate filter, as taught by Shibata, to lower the particulate emissions of the exhaust gas before re-entering the engine, since the use thereof would have reduce exhaust emissions of the charged internal combustion engine.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gladden (Patent Number 6,301,889 B1), in view of Woollenweber et al. (Patent Number 6,062,026).

Gladden discloses the invention as recited above; however, Gladden fails to disclose at least one emissions control device.

Woollenweber teaches that it is conventional in the turbocharged internal combustion engine art having the exhaust gas recirculation system, to utilize at least one emissions control device (Read as Catalyst) (See Figures 1-6).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized at least one emissions control device, as taught by Woollenweber, to improve the exhaust emissions in the Gladden device.

Conclusion

The IDS (PTO-1449) filed on August 21,2003 and January 30, 2004 have been considered. Each initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Coleman et al. (Pub. Number US 2004/0112329 A1) disclose low emissions compression ignited engine technology.

- Pfluger (US Patent Number 6,694,736 B2) disclose a turbocharged internal combustion engine.

- Pierpont (US Patent Number 6,397,598 B1) discloses a turbocharged internal combustion engine.

- Gladden et al. (US Patent Number 6,324,848 B1) disclose a turbocharged system to inhibit surge in a multistage compressor.

- Daudel et al. (US Patent Number 6,209,324 B1) disclose an exhaust turbocharger.

- Coleman (US Patent Number 6,205,785 B1) discloses an exhaust gas recirculation system.

- Sato et al. (US Patent Number 6,435,166 B1) disclose an exhaust gas recirculation device and control method thereof.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (703) 308-6450. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTB
June 18, 2004

Thai-Ba Trieu
Patent Examiner
Art Unit 3748